What is claimed is:

1. A method of determining inventory levels of parts for a
plurality of stocking locations, said method comprising the steps
of:

providing data for a plurality of customer locations, unit price
of said parts, request rates for each of said parts for each of
said customer locations, handling costs for each of said stocking
locations, and travel time and transportation cost between said
stocking locations;

specifying a parts procurement time performance measure;

entering said data and said performance measure into an
optimization computer program;

computing said inventory levels of said parts for said plurality
of stocking locations using said optimization computer program;
and

ordering sufficient numbers of said parts to maintain said
inventory levels at said plurality of stocking locations.

2. The method of claim 1, wherein said data for a plurality of
customer locations includes travel time and cost to transfer a
part from each of said plurality of stocking locations to each of
said customer locations.

3. The method of claim 1, wherein said request rates includes a probability distribution for one or more of said request rates.

4. The method of claim 3, wherein said probability distribution is a Poisson distribution.

5. The method of claim 1, wherein said part procurement time performance measure comprises the percentage of parts in said request rates which can be transferred from any said stocking location to each said respective customer location within a pre-specified time.

6. The method of claim 5, wherein said parts are grouped by importance into a plurality of groups and said pre-specified time comprises a corresponding plurality of times.

7. The method of claim 6, wherein inventory levels are computed to minimize overall cost while meeting or exceeding said plurality of times.

8. The method of claim 1, wherein said optimization computer program is a mixed integer optimization program.

9. The method of claim 1, wherein said inventory levels are computed to meet a total inventory cost while maximizing the percentage of said parts in said request rates which can be transferred from any said stocking location to each respective said customer location within said pre-specified time.

1   10. The method of claim 1, further comprising the step of
2   computing the estimated time for each part to be transferred from
3   any said stocking location to each respective said customer
4   location for each of said parts in said request rates.

1   11. A computer implemented method of specifying parts inventory
2   levels for a network of stocking locations, said method
3   comprising the steps of:

4   providing data for a plurality of customer locations, unit price
5   of said parts, request rates for each of said parts for each of
6   said customer locations, handling costs for each of said stocking
7   locations, and travel time and transportation cost between said
8   stocking locations;

9   specifying a parts procurement time performance measure;

10   formulating a mixed integer optimization model of said network;
11   and

12   entering said model on a processor to solve said mixed integer
13   model to obtain said inventory levels for each of said stocking
14   locations in said network.

1   12. The method of claim 11, wherein said model includes a total
2   inventory cost constraint.

1　　13. The method of claim 11, wherein said inventory levels are

2　　solved to minimize overall cost while meeting or exceeding said

3　　parts procurement time performance measure.

1　　14. A computer system for controlling inventory levels of parts

2　　for a plurality of stocking locations, comprising:

3　　a processor;

4　　one or more files on said computer system containing data for a

5　　plurality of customer locations, unit price of said parts,

6　　request rates for each of said parts for each of said customer

7　　locations, handling costs for each of said stocking locations,

8　　and travel time and transportation cost between said stocking

9　　locations;

10　　means for computing on said processor a parts procurement time

11　　performance measure;

12　　an optimization computer program on said processor for

13　　calculating said inventory levels of parts for said plurality of

14　　stocking locations; and

15　　an ordering system on said computer system for maintaining said

16　　inventory levels at said plurality of stocking locations.

15. The system of claim 14, wherein said data for a plurality of customer locations includes travel time and cost to transfer a part from each of said plurality of stocking locations to each of said customer locations.

16. The system of claim 14, wherein said request rates includes a probability distribution for one or more of said request rates.

17. The system of claim 14, further comprising a mixed integer model of said network.

18. The system of claim 17, wherein said model is formulated to minimize overall cost while meeting or exceeding a pre-specified parts procurement time performance measure.

1   19. A computer program product for instructing a processor to

2   determine inventory levels of parts for a plurality of stocking

3   locations, said computer program product comprising;

4   a computer readable medium;

5   first program instruction means for providing data for a

6   plurality of customer locations, unit price of said parts,

7   request rates for each of said parts for each of said customer

8   locations, handling costs for each of said stocking locations,

9   and travel time and transportation cost between said stocking

10   locations;

11   second program instruction means for specifying a parts

12   procurement time performance measure;

13   third program instruction means for entering said data and said

14   performance measure into an optimization computer program;

15   fourth program instruction means for computing said inventory

16   levels of said parts for said plurality of stocking locations

17   using said optimization computer program; and

18   fifth program instruction means for ordering sufficient numbers

19   of said parts to maintain said inventory levels at said plurality

20   of stocking locations; and wherein

21   all said program instruction means are recorded on said medium.